

● ● ● whoami

\$ whoami

juliusz mucharski

- chemical engineer, bradford
- BEng 2:1 · final year project 81%
- polish citizen · UK settled status (right to work)
- mucharski.juliusz@gmail.com · +44 7858 879237
- github.com/IVLIIVSZ · linkedin.com/in/juliusz-mucharski-427098394

● ● ● education

\$ cat education.txt

MSc · lactic acid bioreactor

- university of bradford · starting 2026
- uncertainty optimisation of a kinetic / process model
- same family as the LTS design: a real vessel, inputs that do not take their worst values independently

BEng (hons) chemical engineering

- university of bradford · 2023 to 2026
- 2:1 (overall 65%) · final year project 81%
- process design · reactor design · heat & mass transfer
- process safety · thermodynamics · numerical methods · uncertainty analysis

● ● ● skills

\$ cat skills.txt

python · modelling

- python, ODEs, parameter sweeps, Monte Carlo, live data through Redis
- probability: Bayes, conditioning, when inputs are not independent
- event and regime models on time series, automated backtests
- backtest, shadow and live on the same code path
- uncertainty: Monte Carlo, CVaR, chance constraints, Clopper Pearson bounds on spec violations
- ask whether a number is real before trusting a point: intervals and certificates, not just a mean
- global sensitivity (Sobol / Saltelli), bayesian calibration of scarce kinetics on a grid
- process models: kinetics, heat balances, thermodynamic constraints
- process safety and ASME VIII pressure vessel design
- linux · git · english · polish

● ● ● projects

\$ cat projects.txt

LTS packed bed · ammonia plant · 81%

- bradford · prof raj patel · 2025 to 2026
- threw out a written 87% conversion the feed could not hit, designed to 85% under a ~86.5% ceiling
- that choice is 15.5 t of catalyst instead of ~76 t, lab powder kinetics were not copied onto plant pellets
- sized the vessel to ASME VIII, 1.80 m × 4.9 m, ΔP ~0.097 bar

event and regime models · live market data

- python engine, Redis, a cockpit, models on live feeds, automated backtests
- research then onto the live box if it holds, replay shadow and live share the same code

T2 laboratories runaway · IChemE SIESO

- reconstructed the 2007 jacksonville explosion from the public CSB report
- heat balance model and an article, uncertainty questions written before the run
- a script recomputes the headline numbers from the committed data

● ● ● papers

\$ cat papers.txt

in preparation · reactors, uncertainty, optimisation, control

- tail risk optimisation of a batch reactive distillation: CVaR and chance constraints, then a certificate that the spec actually holds, the chance constrained pick can look fine until you replay it (winner's curse at the threshold)
- which column you build can change once you score risk not just the mean, paired draws so the comparison is fair
- certified closed loop: an absolute delivery rate mixes the controller with luck in the sample, pairing the same draws isolates the controller
- criticality diagrams under uncertainty: class membership as a certificate not one temperature
- whether a model is "conservative" depends on the event you certify not just the model
- middle vessel operation under kinetic uncertainty, heat balances, reflux, real vessels, still writing, none of this is out yet